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U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF ENTOMOLOGY

NEWS-LETTER

OF

THE

OFFICE OF CEREAL AND FORAGE INSECT

INVESTIGATIONS.

AUG 5 1913

Volume I,

No. 1,

April 1,

1913.

Illinois State Laboratory of Natural History,
URBANA, ILLINOIS, U. S. A.

Vol. I, No. 1.

April 1, 1913.

The number of people at present engaged in the investigation of cereal and forage insects has become so large and so many lines of research are being followed that it is no longer possible for those engaged in the work to keep in such close touch with one another as was possible when the numbers were much more limited. All of the older men are personally acquainted with one another, as well as with the older members of the office force, but many additions have been made in later years, so that owing to their wide distribution this close relationship is no longer possible. It has therefore been thought possible, in part at least, to overcome this lack of comradship by keeping all of those who are employed in any way in connection with this work, posted as to what each one is doing, where he is located, and to afford any other information that would tend to unite and solidify the force. It is quite possible, with the aid of photographs, to show one another some special feature of work that is being prosecuted, exterior views of the various laboratory

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April 1, 1913.

buildings, breeding cages, and other kinds of equipment.

The News-letter will, if it meets with unanimous approval among those most interested, be issued each month, to be circulated only among members of this particular section of the bureau.

I would therefore urge the members of the force working under my direction to make use of it in cultivating a closer relationship with one another. Ask questions and tell in as few words as possible what you are doing and how you are doing it. It is quite likely to come about that general as well as bureau and section orders may be distributed in this way. Let me urge upon assistants throughout the office to combine in making the News-letter as useful and desirable as possible.

F. M. Webster.

IN CHARGE CEREAL AND FORAGE
INSECT INVESTIGATIONS.

The following is a roster of the section, April 1, 1913, with the official address of each.

F. M. Webster, in charge cereal & forage insect investigation, Bureau of Entomology.
Geo. I. Reeves, Room 510, Vermont Bldg., Salt Lake City, Utah.
W. J. Phillips, Exp. Sta. Bldg., La Fayette, Ind.
C. N. Ainslie, Elk Point, S. Dak.
E. O. G. Kelly, U. S. Ent. Lab., Wellington, Kans.
W. R. Walton, Bureau of Entomology.
H. M. Russell, Tempe, Ariz.
T. D. Urbahns, 1519 W. 6th St., Glendale, Cal.
James A. Hyslop, U. S. Ent. Lab., Hagerstown, Md.
J. J. Davis, Exp. Sta. Bldg., La Fayette, Ind.
R. A. Vickery, South Texas Gardens, Brownsville, Tex.
Henry Fox, Exp. Sta. Bldg., La Fayette, Ind.
J. R. Malloch, U. S. National Museum, Washington, D. C.
G. G. Ainslie, Lakeland, Fla.
J. T. Monell, 3454 Halliday Ave., St. Louis, Mo.
V. L. Wildermuth, U. S. Ent. Lab., Tempe, Ariz.
T. H. Parks, Box 351, Greenwood, Miss.
*H. T. Osborn, 485 King Ave., Columbus, Ohio.
W. R. McConnell, Box 351, Greenwood, Miss.
W. R. Thompson, Laboratorio di Entomologia Agraria, Regia Scuola Sup. di Agricoltura, Portici, Napoli, Italy.
Harrison E. Smith, U. S. Ent. Lab., Wellington, Kans.
Philip Luginbill, New Science Hall, Univ. of S. C., Columbia, S. C.
C. W. Creel, Room 510, Vermont Bldg., Salt Lake City, Utah.
P. H. Timberlake, Room 510, Vermont Bldg., Salt Lake City, Utah.
E. G. Smyth, South Texas Gardens, Brownsville, Tex.
R. N. Wilson, U. S. Ent. Lab., Tempe, Ariz.
Vernon King, U. S. Ent. Lab., Wellington, Kans.
E. H. Gibson, Box 261, Nashville, Tenn.
L. P. Rockwood, Room 510, Vermont Bldg., Salt Lake City, Utah.
Philip B. Miles, " " " " " " " "
Thomas R. Chamberlin, " " " " " " "
H. R. Jennings, " " " " " " " "

Margaret Marshall, Bureau of Entomology.
Thomas F. Mahan, " " "
Nettie S. Klopfer, " " "
Mattie Dyer, Room 510, Vermont Bldg., Salt Lake City, Utah.
Chas. Petty, Lancaster, Wis.

*On leave.

Mr. Geo. I. Reeves will continue in charge of the alfalfa weevil investigations in Utah and adjacent States during the coming season, in so far as these relate to field investigations. The other men associated with him are Messrs. Creel, Miles, Chamberlin, and Jennings. The management of the foreign parasites, the introduction of which from southern Europe will continue this year, will be under the supervision of Mr. P. H. Timberlake, recently transferred from citrus fruit insect investigations. He will be assisted by Mr. L. P. Rockwood. This parasitic material is being collected in southern Europe and dispatched to this country by Mr. W. R. Thompson, formerly of the Gipsy Moth Laboratory, who has a number of assistants, among whom is Doctor Martelli, aiding him in securing egg parasites of the alfalfa weevil, to be followed later by parasites of the larva and pupa.

Mr. W. J. Phillips, who has spent some time in the office preparing manuscript, has returned to his field station. During the coming season, aided by Doctor Fox, he will pay special attention to the Isosoma, which he has been studying for a number of years. Whenever other members of the force can do so without interfering with their work, they can aid materially in this investigation of the Isosoma by sending Mr. Phillips stems of different species of grass or grain in which the insects are hibernating. The stems can be rolled in newspaper and the usual memorandum enclosed on a written slip and franked to Mr. Phillips.

Mr. C. N. Ainslie has only just got fairly settled in his new laboratory at Elk Point, S. Dak., and will investigate a number of insects of which the people in that section have complained bitterly during the last few years.

Mr. E. O. G. Kelly continues in charge of the Wellington, Kans., laboratory and with him are associated Mr. Vernon King and Mr. Harrison E. Smith. Mr. Smith was transferred a few months ago from the gipsy-moth work.

Mr. Theodore D. Urbahns will be in charge of the laboratory at Glendale, Cal.

Mr. James A. Hyslop will continue in charge of the laboratory at Hagerstown, Md. His major investigation

will be that of wireworms, and any material sent him with the proper data will be of great aid to him.

Mr. J. J. Davis will continue at the La Fayette, Ind., laboratory with the major investigation of Lachnosterna. Any material that can be sent him by other members of the force, with the proper information relating thereto, will be of much assistance.

Messrs. Vickery and Smyth now have a laboratory at Brownsville, Tex. The old cavalry barracks building at Fort Brown has been assigned to their use and has been fitted up by Mr. Vickery.

Mr. Geo. G. Ainslie, with Mrs. Ainslie, is at Lakeland, Fla., investigating the winter habits of the fall army worm and other injurious species of Florida. In the meantime the laboratory at Nashville, Tenn., is in temporary charge of Mr. E. H. Gibson.

Messrs. Wildermuth and Wilson remain at the entomological laboratory at Tempe, Ariz., investigating, for the most part, alfalfa insects.

Mr. T. H. Parks, who has spent some time in the office preparing manuscript, has returned to the new field station at Greenwood, Miss., where, with Mr. W. R. McConnell, he will carry out investigations of the many insects attacking cereal and forage crops in that section of the country.

Mr. Philip Luginbill has a laboratory in the University of South Carolina at Columbia, S. C., and will work on the fall army worm and other insects of the southern Atlantic Coast region.

Mr. H. M. Russell, recently transferred from truck crop investigations and assigned to the alfalfa weevil investigations at Salt Lake City, on account of the sudden and serious effects of the winter climate on his health, will be transferred to one of the southwestern laboratories.

It has been found that safety razor blades can be advantageously used in place of the larger knives for sectioning, as when the safety blades become dull they can be discarded. It is understood that the razor blade holder furnished by the Bausch & Lomb Co., Cat. No. 3145, is unsatisfactory. The botanical department of the University of Chicago has perfected a safety blade holder that has proved much more satisfactory.

J. J. Davis.

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U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF ENTOMOLOGY

NEWS-LETTER
OF
THE
OFFICE OF CEREAL AND FORAGE INSECT INVESTIGATIONS.

Volume I,

No. 2,

May 1,

1913.

Laboratory of Natural History
URBANA, ILLINOIS, U. S. A.

Vol. I, No. 2.

May 1, 1913.

The Agricultural Appropriation Bill as passed by the 62d Congress contains the following clause: "For investigations of insects affecting cereal and forage plants, including insects affecting wheat, corn, oats, rye, barley, alfalfa, clover, and so forth, $90,000, of which amount not to exceed $10,000 shall be expended for the investigation of the range caterpillar."

Mr. W. R. Thompson, who is collecting parasites of the alfalfa weevil in Southern Europe, has been having remarkable success and has been able to despatch to this country approximately 33,370 more or less heavily parasitized egg masses of the weevil within alfalfa stems. He is ably assisted by Dr. Martelli and others. All consignments are being received at Salt Lake City in excellent condition and are being cared for at that point by Mr. Timberlake.

An exportation of *Aphidius testaceipes*, parasitic on *Toxoptera graminum*, has been carried out. This parasite was reared in great numbers by Mr. Urbahns at Glendale, Cal., where the material has been accumulating for several months. As fast as the parasitized Toxoptera became excessively abundant, the leaves of grain on which they were established were collected and placed in cold storage. The consignment was started April 12 on its long journey to British East Africa, where the tiny voyagers will be cared for and if possible colonized in the wheat fields by the government entomologist, Mr. Thos. J. Anderson.

Writing from Lakeland, Fla., under date of April 13, Mr. Geo. G. Ainslie states that the fall army worm is gradually becoming more abundant as the season advances, although it is heavily parasitized.

Dr. S. A. Forbes, State entomologist of Illinois, reports encouraging success in protecting corn from chinch bugs by spraying with a solution of 3 ounces of flour, 1 ounce of hard soap, and 2 gallons of water. This seems to kill the bugs and of course does not affect the corn. Try this on chinch or other bugs and report results, to be transmitted to Dr. Forbes.

The Range Caterpillar Investigations in New Mexico will be temporarily under the supervision of Mr. V. L. Wildermuth with a corps of men to be brought together as soon as possible. Mr. Wildermuth has already made a preliminary survey of the infested territory with a view of beginning work as soon as the larvae commence to hatch from the eggs.

Much difficulty has heretofore been experienced in transporting living material, especially larvae and pupae, from the field to the office, so as to reach its destination in shape for illustrating. Mr. Urbahns has just succeeded in getting live larvae and pupae of Bruchophagus funebris through from California in perfect condition by placing them singly between small 1 X 3 inch strips of 1/8-inch cork, in cavities hollowed out in one of the pieces of cork. The two pieces of cork can be fastened to fit tightly together. There seems to be no danger from lack of moisture and no excess of the same. Try this as opportunity offers with eggs or such objects as will not eat their way out.

Second in importance to careful accurate field investigations is the placing of the details and results thus obtained on record in clear, concise language, eliminating repetitions and superfluous words or explanations which are always more or less confusing and lead to error. When one comes to the office to prepare manuscript for the printer he quickly becomes aware of the importance of this feature of our work; but not all of the force have had this training.

All notes go to the credit of the observer. It sometimes happens that he is out of reach, perhaps out of the country, when the information given in his notes is used in manuscript, and it is of the utmost importance to himself as well as to the Bureau that his statements be clear and accurate as well as complete, and it is a matter of personal as well as official justice that they be so.

It is a failing among good investigators to dislike the tedious duty of writing up results after they have bee obtained, but results are of little value if they can not be made both reliable and readily available for the use of others, whether their interests be scientific or economic. Prepare your notes exactly as you want them to be understood by others and never leave editing to be done in the office. No one, no matter how able, can do justice to himself or any one else in writing up the work of another, unless he can know with certainty just what that worker himself wished to say.
Mr. H. M. Russell is slowly recovering his health at Tempe, Ariz., and will go on duty there about May 1.

Mr. A. B. Gahan, recently of the Maryland Agricultural College, will begin his work with us, as specialist in parasitic Hymenoptera, May 15, superseding Mr. Viereck, who recently resigned from the Bureau.

Mr. E. G. Smyth, for several years attached to the Station at Brownsville, Tex., has resigned to accept a similar position in Porto Rico.

An interesting letter has just been received from Mr. George R. Smith, who was formerly with the Salt Lake, Utah, Station, but who resigned to accept a position with the Government of Argentina.

Mr. A. F. Satterthwait, Harrisburg, Pa., has been appointed as an expert in Cereal and Forage Insect Investigations and will go on duty at La Fayette, Indiana, assisting Mr. Davis in Lachnosterna investigations.

Mr. J. R. Malloch has prepared a revision of the dipterous genus Agromyza which will be printed in the September Number of Annals of the Entomological Society of America. The same author is engaged on a revision of the Oscinidae.

Mr. T. H. Parks, who has been in charge of the Station at Greenwood, Miss., since its establishment last autumn, has resigned to accept a position in Idaho. Mr. Parks will make a faithful officer wherever he goes and he will take with him the best wishes of this section of the Bureau.

Numerous observations have been made during April on the condition of the fall army worm, from which, as will be seen, it is exceedingly doubtful if the species winters north of the latitude of Florida.

Mr. W. B. Hall, Wakeman, Ohio, gathered a large number of pupae last fall and placed them in the ground, but not a single individual appears to have survived. Mr. W. J. Phillips, who visited South Bend, Ind., on April 18, could not find a single live pupa; all were dead. Those that were being carried through at La Fayette, Ind., also perished.

No trace of live pupae has been found at Chillicothe, Mo., where fields of young fall wheat were destroyed last fall.

Mr. Luginbill states that while moths were observed at Columbia, S. C., the latter part of November, so far as his observations have gone the species does not winter over at that point. He states also that Dr. Hinds informed him that the same conditions applied to Alabama, presumably in the vicinity of Auburn.

Thus we have, so far, no definite proof that _Laphygma frugiperda_ survives the winter north of Florida and southern Texas.

COPY

UNITED STATES DEPARTMENT OF AGRICULTURE,
Division of Accounts and Disbursements,
Washington, D. C. , April 21, 1913.

Dr. L. O. Howard,
Chief, Bureau of Entomology.

Sir:

This office is in receipt of the following letters:

"Chicago, April 15, 1913.

Mr. A. Zappone,
Chief of Division of Accounts and Disbursements,
U. S. Department of Agriculture, Washington, D. C.

Dear Sir:

Every month this Company receives a great many U. S. Dept. of Agriculture transportation requests drawn in favor of some railroad Co., for Pullman accommodations. As it is necessary for this Company to forward the requests to the different Railroad Companies for waivers before same can be billed, thereby causing a great deal of unnecessary correspondence, it is requested that you kindly take the necessary steps to have requests for Pullman accommodations drawn in favor of The Pullman Co. in all cases, and oblige,

Yours truly,
(Signed) L. M. Bradish,
Auditor of Receipts."

Washington, D. C., April 17, 1913.

Disbursing Clerk,
Department of Agriculture,
Washington, D. C.

Dear Sir:

The Atchison, Topeka & Santa Fe Ry. Co. advises that for some time past it has been receiving from the Pullman Company a considerable number of Department of Agriculture requests which have been drawn on the Santa Fe Co. for Pullman transportation. Recently the number of such requests has been increasing, and as the matter involves much extra labor and accounting for proper adjustment we will appreciate it if your office will issue the necessary instructions to all Bureaus of the Department, requesting that requests for Pullman transportation be drawn upon the Pullman Company.

Very respectfully,
(Signed) Britton & Gray,
Attys. A.T. & S.F. Ry. Co."

"April 22, 1913.

Memorandum for Professor Webster:

I enclose herewith copy of communications referring to the use of transportation requests for Pullman accommodations. Please bring this matter to the attention of the employes of your branch.

(Signed) R. S. Clifton,
Executive Assistant."

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OF

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[illegible] OF CEREAL AND FORAGE INSECT

[illegible]

Volume 1,

No. [illegible]

[illegible]

[illegible].

Illinois State Laboratory of Natural History,
URBANA, ILLINOIS, U. S. A.

Vol. I, No. 3,

June 1, 1913.

A distinguished visitor, Dr. Paul Marchal, Chief of the Entomological Station of Paris, France, recently spent considerable time in Washington and in the company of Doctor Howard called upon some of the field stations of this division. Everyone, and especially those who are investigating the development of parasitic Hymenoptera, know of the excellent work done by Doctor Marchal, who, besides being one of the best known entomologists of Europe, is a most pleasing gentleman.

Within the last year or two some fatal fungous diseases have broken out in the midst of white-grub ravages and myriads of the pests have died, evidently from the effects of some of these diseases. Dr. S. A. Forbes has had large quantities of these fungi propagated artificially, and it is expected that material will be sent to several assistants of this division, if this has not already been done, to be applied in the fields. Therefore the following suggestions relative to the experimental use of one of the most promising of these fungi may prove of service to members of the force who may have occasion to apply it in that way.

Method of Testing METARRHIZIUM ANISOPLIAE Against the White Grub.

As soon as corn is up make a strict search for a field of corn that is being injured by the grubs. Make certain of an abundance of grubs by actual examination as well as by the observed injury to the corn plants.

Each jar of fungous culture contains 100 pieces of inoculated potato and it is estimated that one piece of potato to a hill of corn is sufficient. In applying the fungus first thrust a trowel or sharp-pointed instrument into the soil among the corn plants in the hills infested with grubs. Push the trowel forward in order to make an opening, drop a piece of the potato from the culture jar into this opening, and remove the trowel. It is necessary to "plant" the piece of potato 2 inches below the surface. Where it is at all possible the treatment should be made in a field generally infested so as to have a check plat for comparison later.

It is essential that the fungus be applied as early in the season as possible after an infested field is located, for the grubs in most of the territory infested in 1912 will become inactive in June and pupate in July or August.

The treated field should be visited as often as practicable and examinations should be made to observe the action of the fungus. Careful notes should also be made on the weather conditions for the month following the application.

Mr. T. Scott Wilson, recently appointed from Kansas, has been assigned to the station at Tempe, Ariz.

Mr. Claud L. Scott of Oklahoma, appointed early in May, was assigned to the Brownsville, Tex., station, superseding Mr. E. G. Smyth, who resigned to go to Porto Rico.

Mr. H. T. Osborn, formerly with the Salt Lake City, Utah, Station, has recently resigned to accept a position with the Sugar Planters' Association in Hawaii. Every one who knows Mr. Osborn will wish him abundant success in his new position.

Mr. Monell has found considerable difficulty in mounting and determining specimens of Aphididae that have been preserved in formaldehyde. He has found that where a 5 per cent solution is used no trouble whatever is found in clearing up the specimens by soaking a short time in water. Therefore, when using formaldehyde for preserving it would be best to use about a 5 per cent solution.

In using lantern globes to cover potted plants in insectary and laboratory work, some difficulty has been experienced in devising means of removing the insects, notably parasites, without also removing the lantern globe. Mr. Kelly has overcome this by having tin bands about 3 inches long made with a groove to fit over the flange of the lantern globe and with a hole in the side for inserting a glass tube or vial. With the globe darkened and the top covered the only light is through the vial inserted in the tin band. The insects within the globe are thus attracked to the vial and can be removed without disturbing the globe. The device will be sent to any one who would like to try it in his work.

Among the new men who have been appointed to Cereal and Forage Investigations during May are Dr. J. M. Aldrich, recently of the University of Idaho, and author of the "Catalogue of North American Diptera." Doctor Aldrich will be engaged in studies of the development of Oscinidae and Agromyzidae. Others who have been recently appointed are Mr. Donald J. Caffrey, recently of the Connecticut Agricultural Experiment Station; Mr. Guy E. Pitts of Oklahoma; Mr. W. F. Schlupp of Ohio; Mr. J. R. Coolidge, Arizona; Mr. F. H. Gates, Colorado; and Mr. Irving Crawford, South Dakota; all assigned to the Range Caterpillar Investigations. Mr. Crawford was with the Wellington, Kans., station during the summer of 1912. Besides these, who are working under Mr. V. L. Wildermuth, Mr. Jos. S. Wade, of Kansas, has been assigned to the Wellington, Kans., laboratory; Mr. Geo. E. Quinter, of Washington, D. C., who has just finished his freshman year at the University of Pennsylvania, has been assigned to the Hagerstown, Md., laboratory.

It is sometimes difficult to find flowerpots that are entirely fitted for our use in out-of-door breeding work where these flower pots have to remain in the ground throughout the winter. Mr. Davis has been using pots furnished by the W. H. Elverson-Pottery Co., New Brighton, Pa., and states that he has used them out of doors all winter, both above and below ground, filled with soil without a single one having been broken. They are no more costly than others but they are stronger and seem to bear more abuse than those of any make we have previously been able to secure.

Department of Agriculture,
Washington, D. C.

Office of Assistant Secretary.

NO. 16 April 28, 1913.

MEMORANDUM FOR THE SECRETARY

CONCERNING DEPARTMENTAL PUBLICATIONS IN SCIENTIFIC AND TECHNICAL JOURNALS

Dear Mr. Secretary:

For the last five or six years the appropriations for the work of the Department have grown rapidly, while the appropriations made for publishing results of investigations have grown slowly. As a result there is a great deal more material being accumulated which should be published than it is practicable to publish, owing to lack of funds and for other reasons. For the last ten or twelve years it has been the policy of the Department not to permit any of its technical work to be published outside, with the result that there has been considerable stagnation and some rather important results have been lost through lack of timely publication.

It is believed that by taking advantage of Existing specialized avenues of publication the usefulness of a considerable amount of scientific and technical work done by the Department would be increased and the financial strain, which is now a serious handicap to the Department, would be practically removed. It is the practice of many institutions, as you know, using public money, to permit publications of this kind in outside reputable journals, provided in all cases proper credit is given to the institution. [illegible] hereafter that reports of technical research, designed particularly for the attention of scientists in other institutions, be published in any scientific journal which is presumed to reach most satisfactorily those scientists. In no case, however, should the authors accept compensation for such articles. Manuscripts for scientific and technical journals should receive the

[illegible] and should also be submitted to the Secretary's office before being forwarded for publication.

Very respectfully,
(Signed) B. T. Galloway,
Assistant Secretary.

Approved:
D. F. Houston
Secretary.

With outbreaks of grasshoppers in New Mexico and Idaho, of the true army worm in Virginia, and of MYOCHROUS DENTICOLLIS in Arkansas, the prospects are for a busy summer for entomologists.

One of the first surprises of the season has been the finding, by Messrs. Kelly and King, of a wireworm, CARDIOPHORUS sp.(?) in destructive abundance, by the latter about Charleston, Mo., and by the former at Tuckerman, Ark., and Pryor, Okla. At Tuckerman these larvae were found from 2 to 44 per hill of corn. Heretofore we have received but a single complaint of injury to corn from CARDIOPHORUS larvae and this came from North Carolina. Doctor Forbes, in his bulletin on corn insects, states that it had been received by him as such but once.

The following note will indicate the progress of the consignment of APHIDIUS TESTACEIPES mentioned in the May number of the News-Letter:

"I have to acknowledge the receipt of your letter of the 1st of May, and to inform you that the parasites were duly received and have been trans-shipped for East Africa. We have to thank you on behalf of the Government of the East Africa Protectorate for the trouble which you have taken in the matter."

(Signed) Crown Agents for the Colonies,
Whitehall Gardens,
London, S. W.

Department of Agriculture,
Washington, D. C.

Office of Assistant Secretary.
May 10, 1913.

MEMORANDUM NO. 19.
(Re Express Shipments of Government Property)

Attention of the various offices and bureaus of the Department is called to the attached copy* of a memorandum from the Solicitor in regard to the shipment of an instrument [illegible]

route, and the inability of the Department to recover from the Express Company the value of the instrument in excess of $50, on account of the fact that no value was declared at the time of shipment.

In view of this experience the following practice should obtain in the Department in connection with shipments of its property by express:

Where the value of the property is under fifty dollars, no value should be declared.

Where the actual value of the shipment is in excess of fifty dollars such value should be declared and the increased express charge paid by the Department.

(Signed) B. T. Galloway,
Assistant Secretary.

*Omitted here.

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Illinois State Laboratory of Natural History
[illegible] U. S. A.

Vol. I, No. 4.

July 1, 1913.

As stated in the first, or April number of the News-Letter, its object is to bring the continually increasing number of people engaged in cereal and forage insect investigations into closer touch with one another and to keep the individual informed, in a general way, of what is being done [illegible] of the News-Letter is to [illegible] and solidify the division, for it is upon this that the successful carrying out of so many diverse investigations must largely rest.

In the beginning applied entomology consisted merely in the treatment of garden plants with soot, ashes, lime, or perhaps white hellebore, affording relief only to the gardener. [illegible] West probably did much to bring to the front the applica- [illegible] confined largely to the truck farmer and gardener. To the grower of grains and forage crops all of this afforded no relief whatever. Still later, the work on the cotton worm of the South brought into practical use the preparation and application of kerosene emulsion. Still the grower of grains and grasses found no relief. A little later began the spraying of trees and shrubs, which, while it opened up an almost new era for the fruit grower, still left the ordinary farmer with his problems of insect control practically unsolved.

Before the advent of experiment stations and even for some time afterward, letters addressed to the members of university faculties complaining of the ravages of insects and asking relief brought the actual farmer little consolation. The replies he received to his appeals for relief were usually couched in terms to which he w as unused and much of the text of these replies in a language that he did not understand. Moreover, the replies were usually penned by men who had little or no practical knowledge of agriculture, and thus there grew up between the two not only a continually widening breach but in many cases an absolutely intolerant feeling on the part of each for the other.

Perhaps nothing better illustrates the changed condition and rapid growth of agriculture as a science than the immense strides made by economic entomology as applied over and throughout the broad acres of the ordinary farmer. At the present time, instead of receiving a stereotyped reply to his applications for relief, when he applies as an individual, or for his neighborhood, [illegible] coming every day more and more frequent, through his Representative in Congress(, he is very often surprised that, within two or three days after the receipt of his complaint, there appears in his neighbor-

[illegible] on the farm, and, besides this, has had a thorough university training, and, perhaps, is further equipped by having been engaged in the investigation of insects over a wide range of country, including perhaps no small number of the United States. Instead of receiving a letter which to him might, perhaps, so far as practical aid is concerned, have been written in a foreign language, he finds that his visitor can go about over his and his neighbors' farms with him and with a clear understanding [illegible] them in what manner they might have avoided their injuries and saved their money. He will tell him of things that, though he [illegible] his neighbors have ever yet been able to observe. His caller not only fits into their farm life and speaks to him in the language of [illegible] and broadly the way, much of what to him has heretofore been a mystery. The young man points out to him wherein their farm methods have, in many cases, been primarily responsible for their previously sustained losses by insect attack. It does not greatly matter of what State he may be a resident, if his locality is not too inaccessible and the matter is of more than local importance, any of the men located at the fifteen different field stations can be wired instructions that will send them to his relief. In this way entomology as applied to the broad acres of the farm has within the last twenty-five years become completely revolutionized. This means much to the growers of grains and forage crops and to the stock breeder. Moreover, it means almost equally as much to the banker, the manufacturer, and the merchant, all of whom are coming to recognize the fact.

On July 1, 1904, the writer was the sole member of the section, Messrs. Geo. I. Reeves and W. J. Phillips being appointed a few months later, and the expenditures for the fiscal year 1904-1905 were some $6,000.

FISCAL YEAR 1913-1914.
PERSONNEL OF THE STAFF OF CEREAL AND FORAGE INSECT INVESTIGATIONS.

F. M. Webster (Ill.), *in charge*.

CLERICAL.

W. R. Walton (Pa.), Mattie M. Wilson (Minn.),
Margaret Marshall ([illegible]), Thos. F. [illegible] (Mass.).

TECHNIC-BIOLOGICAL.

A. B. Gahan (Md.), J. T. Monell (Mo.),
J. M. Aldrich (S. Dak.),

LAFAYETTE, INDIANA, FIELD STATION.
W. J. Phillips (Va.), *in charge*.

J. J. Davis (Ill.), Henry Fox (Pa.),
A. F. Satterthwait (Pa.).

WELLINGTON, KANSAS, FIELD STATION.
E. O. G. Kelly (Ky.), *in charge*.

Harrison E. Smith (Mass.), W. D. Pennington (Md.).
Joseph S. Wade (Kans.).

CHARLESTON, MISSOURI, SUB-STATION.
Vernon King (Canada).

BROWNSVILLE, TEXAS, FIELD STATION.
R. A. Vickery (Minn.), *in charge*.

Claud L. Scott (Ohio), O. W. Rosewall (Iowa).

NASHVILLE, TENN., FIELD STATION.
G. G. Ainslie (Minn.), *in charge*.

W. H. Larrimer (Ohio).

TEMPE, ARIZ., FIELD STATION.
P. H. Wilson (Colo.), *in charge*.

T. Scott Wilson (Kans.), J. H. Newton (Ariz.).

SALT LAKE CITY, UTAH, FIELD STATION.
Geo. I. Reeves (Ill.), *in charge*.

C. W. Creel (Nev.), H. R. Jennings (Kans.),
Philip B. Miles (Colo.), S. J. Snow (Utah),
Thomas R. Chamberlin (Utah), [illegible] Bunnion (Utah),
R. J. Kowley (Utah),
Mattie Dyer (Utah), stenographer.

SALT LAKE CITY, UTAH, SUB-STATION.
P. H. Timberlake (N. H.), *in charge*.

L. P. Rockwood (Conn.), W. R. Thompson (Canada).
(In Europe.)

[illegible]

[illegible]

COLUMBIA, S. C., FIELD STATION.
Philip Luginbill (Ohio), in charge.

GREENWOOD, MISS., FIELD STATION.
W. R. McConnell (Pa.), in charge.

[illegible] Gibson (Mich.).

ELK POINT, S. DAK., FIELD STATION.
C. N. Ainslie (Minn.), in charge.

[illegible] J. Bashe (Iowa)

GLENDALE, CAL., FIELD STATION.
T. D. Urbahns (Colo.), in charge

[illegible], N. MEX., FIELD STATION.
V. L. Wildermuth (Ohio), in charge.

[illegible]ld J. Caffrey (Conn.),
[illegible] Pitts (Okla.),
[illegible]

J. R. Sandige (Ariz.),
F. H. Gates (Colo.),
[illegible] P. Crawford (S. Dak.).

COLLABORATORS.

[illegible]

[illegible] (Ohio).

Geo. G. Ainslie has returned from his investigations of [illegible] army worm in Florida to resume his duties at his field station, Nashville, Tenn.

Monsieur A. Vuillet, Preparatèur a la Station Entomologique de Paris, has given a 15-page review of Bulletin 110, on Toxoptera graminum, in the Bulletin de la Societe d'Etude et de Vulgarisation de la Zoologie Agricole, under the title "Le Puceron des Cereales et ses Invasions aux Etats-Unis."

[illegible]

The range caterpillar investigations have been commenced [illegible] somewhat unusual circumstances. Rains occurred during twenty out of the first twenty-two days, washing out railway bridges and destroying telegraph and telephone lines. This, too, is an arid country.

P. H. Timberlake, charged with the management and work of developing and distributing introduced parasites of the alfalfa weevil, reports under date of June 16: "We have secured specimens of Canidia "A" from parasite in the field at Murray, showing that this species has successfully passed the winter here in America. We obtained two Canidia from comparatively few [illegible] at that point."

We have received from Mr. Longfield Smith, director of the experiment station at St. Croix, Danish West Indies, specimens of the fulgorid Dicranotropis maidis, with the statement that the insect is doing a great deal of damage to maize in that locality during the present season. Mr. Smith states that he grew maize at the experiment station last year but did not notice the insects or their ravages. The species was described by the late Doctor Ashmead in 1890 from Jacksonville, Fla., where he found it also damaging corn. Our own records do not show any further injury to corn in this country.

We have received from Mr. W. Moore, lecturer in entomology at the agricultural School at Potchefstroom, South Africa, specimens of what Mr. Mcneill has determined as Aphis maidis. Mr. Moore states that it is found upon sorghum, maize, and grasses such as Panicum. It appears in January and is abundant for the rest of the summer. It is also abundant in the Orange River Colony and Basutoland. He reports, with specimens, which were determined by Mr. Mcneill as Aphis nerii, stating that this species is found on Asclepias and is abundant throughout the summer.

The same gentleman has sent us the following parasites, which have been determined by Mr. Gahan: What is probably Aphidius phorodontis, reared from the green peach aphis and also from Toxoptera and reared from the latter into the green peach aphis, and the offspring reared into the black peach aphis. The offspring of these were bred into the cabbage aphis, from which the species was again reared. The same parasite was also reared from Aphis nerii, from which it was bred into Toxoptera. Mr. [illegible] also reared Diaeretus rapae from the cabbage aphis and from [illegible] the green peach aphis on cabbage, and using unfertilized females bred it also through this same aphis into and from Toxoptera.

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U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF ENTOMOLOGY.

NEWS-LETTER

OF

THE

OFFICE OF CEREAL AND FORAGE INSECT INVESTIGATIONS

AUG 5 1913

Volume I,

No. 5,

August 1,

1913.

Illinois State Laboratory of Natural History,
URBANA, ILLINOIS, U. S. A.

Vol.I, No. 5. August 1, 1913.

Mr. E. R. Kalmbach of the Biological Survey has been detailed to cooperate with us in a study of the relation of birds to the range caterpillar, and has already left for New Mexico.

Mr. W. J. Phillips and Dr. Henry Fox will, during the month, move from La Fayette, Ind., to Charlottesville, Va., there to continue their work in a new laboratory to be established near the latter city.

Of the office force, Miss. Marshall is taking her vacation and Mr. W. R. Walton has gone to Koehler, N. Mex., to investigate the native species of Tachinidae and their relation to the range caterpillar.

Mr. R. N. Wilson has been in the Imperial Valley, California, looking after the situation relative to Eurymus eurytheme. It seems that just as the caterpillars of this species were about to destroy the alfalfa, a bacterial disease broke out among them and they died off in myriads.

Mr. Geo. I. Reeves has the men at work under his direction engaged in following out shipments of freight and express, made from central points in the country infested by the alfalfa weevil in order to determine if possible just to what extent the railways are likely to become instrumental in diffusing the pest. Both railway and express companies are affording himself and his men every possible facility for carrying out this work, which has long been in need of attention.

There does not appear to be a well defined understanding among some members of the force as to just what miscellaneous observations are of value, such as one can easily make in going about his other work. It is of no consequence whatever to record the simple occurrence of an insect on a plant unless it is feeding upon or otherwise affecting such plant, notably ovipositing, or, as in case of Aphididae and allied insects, reproducing and the young found to be living on the plant. Otherwise the occurrence may be due to a coincidence. They must rest somewhere. Notes on food plants, or on the habits and actions of insects that are known to attack grain or forage crops are usually worth recording unless such facts are already well known. Miscellaneous notes, intelligently made, involving food plants, habits, or natural enemies, are desirable subjects of record, and no one who has not himself prepared manuscript for publication can fully comprehend the value of these fragments, which, when brought together, often supply the missing links in more extended studies, or round out these last, frequently in this way rendering the preparation of a complete paper possible.

Mr. C. N. Ainslie reports serious ravages to corn in South Dakota by attacks of Diabrotica longicornis, while Geo. G. Ainslie finds the pest attacking corn on bottom lands as far south as Chattanooga, Tenn.

Mr. Harrison E. Smith has returned to Wellington, Kans., from his trip to New Mexico where he was sent to study an outbreak of Dissosteira longipennis, and has since been working, in cooperation with Prof. Dean of the Agricultural College, in suppressing outbreaks of other species in Kansas.

Mr. N. Kourdumoff, Poltava, Russia, with whom a number of the staff are presumably acquainted, has had the kindness to compare the alfalfa weevil parasites, shown in figures 19 and 20, page 37, Bulletin 112, with type specimens and thus has been able to determine them for us as female and male of Dibrachoides dynastes Foerster. Further, Mr. Girault has also described the species figured in the same Bulletin, p. 34, fig. 15, as Anaphoides luna. Members of the staff can, therefore, correct their copies of this Bulletin accordingly.

Prof. F. Silvestri, R. Scuola Superiore di Agricoltura, Portici, Italy, recently paid Washington a hurried call on his way home to Italy via San Francisco. As illustrating the status of applied entomology among the civilized nations of the world, Prof. Silvestri was carrying with him hundreds of adult hymenopterous parasites belonging largely to the subfamily Opiinae. These were kept in vials and were fed with honey thinned with water. One species which he had obtained was parasitic upon the house fly. American entomologists will be intensely interested in learning what Prof. Silvestri has been able to do with these tiny insects, transported by himself from West Africa to Italy by this unusual method and by such a circuitous route.

Through the instrumentality of Mr. Burgess of the Gipsy Moth work, a number of Calosoma sycophanta of both sexes were sent to Koehler, N. Mex., in June, as a basis for an experiment with the species as against the range caterpillar. Under date of July 10, Mr. Wildermuth states that adults feed on Hemileuca larvae quite savagely, a single pair eating as high as forty fourth-instar Hemileuca larvae in a single day. Also, adults of two other species, C. calidum and C. frigidum, attack Hemileuca larvae. There still seems to be a question, however, whether or not the larvae of C. frigidum and C. sycophanta will readily attack the Hemileuca larvae. Still later, Mr. Summers, carrying out instructions from Mr. Burgess, shipped to Koehler about 200 puparia of Compsilura concinnata, a tachinid parasite to be used in experiments to determine if this species will successfully parasitize Hemileuca caterpillars.

There appears to have been recently quite a serious outbreak of the big green bug, Pentatoma sayi, in New Mexico and Texas, resulting in considerable damage to grain.

Mr. C. Mason, the latest Carnegie student in applied entomology, has recently come to us from England and has started out on his journey of observation over the country. Mr. Mason will visit a number of our field stations to learn what we are doing and how we are doing it, and to that end we wish every one to aid him in any manner possible.

Mr. Vernon King is having his hands full at Charleston, Mo., following out Horistonotus uhlerii, which we at first supposed was a species of Cardiophorus. This wireworm is quite distinct from other species, in that, while the latter nearly if not quite always selects the lower and damper lands, this species works on the higher and drier lands. It has evidently destroyed corn on such lands over a large area in southeastern Missouri and northeastern Arkansas.

Mr. Luginbill, writing under date of July 3, stated that up to that time he had been able to find no traces of the fall army worm in the vicinity of Columbia, S. C. A few days later he ran across the larvae feeding on corn and crab grass in limited numbers which have since developed adults. This is very evidently the first generation for that point and therefore corresponds very well in date with the serious outbreak that occured last year in the same locality. Up to the present time none of the force has been able to detect its presence to the westward except Mr Vickery at Brownsville, Tex. Mr. Vickery, writing under date of July 16, states that the larvae of Laphygma were numerous on young corn early in spring but most of them were killed by parasites. He states that during the last three years he has always found the larvae on corn at all seasons and usually very numerous. During March Mr. T. H. Parks searched carefully along the gulf coast from Mobile, Ala., to St. Bernard, La., without finding a trace of the larvae of this species. During the same period Mr. Geo. Ainslie found the larve attacking corn severely about both Lakeland and Orlando, Fla. This all bears out the conclusion drawn from last year's observations, namely, that the species does not winter much north of central Florida and southern Texas, and that so long as it is controlled by its natural enemies in these localities during winter and early spring, no danger is threatened the country farther northward. Moreover, that the trend of diffusion during seasons of normal abundance is coastwise rather than inland. Evidently the overflow of the Mississippi River has no influence in bringing about an invasion in the lower Mississippi Valley, but may greatly accentuate such an invasion during years of excessive abundance, as was the case last year. Recent observations by Messrs. McConnell and Gibson show that up to this time the pest has not appeared in the delta section of Mississippi.

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U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF ENTOMOLOGY.

NEWS-LETTER

OF

THE

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INVESTIGATIONS.

Volume I,

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October 1,

1913.

Vol. I, No. 7.

October 1, 1913.

Recently, while attending the 50th anniversary meeting of the Entomological Society of Ontario at Guelph, Canada, Dr. C. Gordon Hewitt, Entomologist for the Dominion of Canada, handed us these notes on the Criddle mixture, by the originator, Mr. Norman Cridile, Treesbank, Manitoba, and they are being used here with the consent of Mr. Cridile. The notes will have a double value, in that they not only show the work of a careful observer but also the much to be desired qualifications in a field entomologist, namely, the ability to utilize the results of careful observation.

SOME NOTES ON THE "CRIDDLE MIXTURE."

The origin of the grasshopper bait, christened by the late Doctor Fletcher, Criddle Mixture," was due to an observation that grasshoppers were in the habit of abandoning all vegetation in favor of freshly-dropped horse dung, this preference being so marked as to leave no doubt in the minds of even the most casual observers. Droppings left several hundred feet in the midst of growing grain at once attracted grasshoppers from the edges of fields so that they might be seen marching steadily towards the direction from which the odor came, and then, having speedily devoured the droppings, they attacked the surrounding crop with the result that a large bare patch would be made in the midst of it. A few examples such as this seem in temselves sufficient evidence of the substances attractiveness, but if more were needed the roads and manure piles amply verified what had been observed before.

The second ingredient, salt, was also added through observation. It is well known that clothing and the handles of any farm implement will attract grasshoppers on account of the salty taste, caused through contact with the human skin, while experiments supplementary to this observation showed that they readily ate any article steeped in salt water. For this reason salt was added and proved particularly valuable after the droppings became dry.

The third ingredient was largely a matter of cost and convenience. Paris green, arsenic, or arsenite of soda would doubtless prove equally successful as a killing agent, and Paris green was selected on account of its availability in sufficient quantity. After numerous experiments the following formula was adapted as most suitable:

Horse droppings, preferably fresh, by measure-----100 parts
Salt--1 pound or part
Paris green---------------------------------1 pound or part

This approximates 15 gallons by measure of horse manure to 1 pound of Paris green and salt. It may be mixed in two ways, namely, dry with sufficient water added to make a thoroughly moist, but not sloppy, mash; or by placing the Paris green and salt in water first

and pouring this over the droppings. Before application it isnecessary to pay some attention to weather conditions. Cloudy days, or those in which the temperature is below 60° F., should be avoided and preference given to those in which sunshine and heat predominate. In applying it the best method seems to be to scatter it thinly among the grasshoppers every few days. It can, however be put out in small heaps, in which condition its attractiveness lasts longer but it is more dangerous to stock.

There is no doubt whatever as to the remarkable attractiveness of this mixture at all periods, from the time of the locust' appearance in May until they die in September, or of its superiority over any other form of extermination yet tried in these parts. The evidence of farmers is almost unanimous on this point, and all the best type speak with enthusiasm of its value, the few exceptions being due to faulty methods in its application and mixture. My brothers and I have also used it continuously for the last ten years with perfect success and at very small cost, the last occasion being this season when we undoubtedly saved many acres of crop, while on more than one occasion its use undoubtedly saved the whole crop, as was shown by the destruction of those not treated.

This, however, refers only to Manitoba, as my experiences have been but casual outside, but I am of opinion that climatic conditions, particularly humidity, play an important part in the sucess or failure of this mixture. From a few observations made in Quebec some years ago I found horse dung far less attractive there, and the roadways, which in Manitoba would be swarming with locusts, were comparatively free. Judging from this, I would expect to find it valueless in the moister parts of Canada and the U. S., and most useful in the dryer Northern States, particularly the Dakotas, Minnesota, and Montana, as well as Alberta, Saskatchewan, and Manitoba.

Why a mixture so attractive in Manitoba should prove useless in Quebec in a time of drought, with the same species of grasshopper involved, is difficult to answer. That it is so there seems no doubt, and the problem is therefore to ascertain, with accuracy, what the conditions are and where the conditions are favorable or otherwise. I should consider that a trustworthy indication would be to watch the freshly-dropped dung and roadway. When the dung is eaten freely, the mixture should prove a success;when grasshoppers are not so attracted it will prove a failure.

It may not be out of place to remark in conclusion that stable water from behind the stalls is even more attractive than dung and has proved a remarkable attractant when mixed with other material such as bran or sawdust, while grasshoppers have been observed to actually devour the earth in places where it has been left. Dry cow dung is also readily devoured.

Norman Criddle,

August 22, 1913.

Messrs. Guy E. Ellis, of the range caterpillar investigation force, and Henry E. Jennings, of the alfalfa weevil investigation force, have both resigned.

Mr. L. J. Bower, a graduate in Entomology at the Texas Agricultural College, has been appointed to this Section and attached to the Wellington, Kans., station.

The terrible drought in Kansas is very seriously interfering with the work of Mr. Kelly and the rest of the laboratory force at Wellington, even if it does not make a temporary removal to some othe point necessary.

Mr. Geo. I. Reeves spent some time during September in oregon and Washington looking up a number of matters, among them what appears to be an outbreak of the clover flower midge in the Willamette Valley.

A rather serious outbreak of the chinch bug occurred during early September in pastures on the demonstration farm of the Bureau of Animal Industry at Denison, Tex., and was investigated from our Wellington, Kans., station.

Messrs. John R. Sandige, Irving R. Crawford, F. H. Gates, E. J. Bache, Olin [illegible], C. H. Sexton, and Arthur [illegible], short term men, have all returned to their college and university work. Mr. C. W. [illegible] goes to take up his work as instructor in entomology in the Louisiana State University, Baton Rouge, La.

Mr. C. N. Ainslie has recently found that larvae of Diabrotica longicornis have done a great deal of damage to growing corn in South Dakota and eastern Nebraska, and has found adults scattered over southern Minnesota. Mr. George G. Ainslie is finding the same insect infesting corn in bottom lands in Tennessee, while he finds that the beetles are common in similar localities in Kentucky.

It will be a matter of interest to all to know that Dr. Hewitt, Entomologist of the Dominion of Canada, is organizing a series of field laboratories and stations patterned after those in the United States. Dr. Hewitt is to be congratulated on securing such a promising lot of young fellows as he now has working under him and laying the foundation for future work, which surely will make its influence felt in Canadian husbandry. Doctor and Mrs. Hewitt expect to visit some of our field stations, notably at Salt Lake, during the current month.

Mr. Hyslop made a trip to Bridgeport, N. Y., to continue observations on white grubs.

The rearing of an egg parasite of the chinch bug, in Kansas, by Mr. Jas. W. McColloch, of the Kansas Agricultural College, described by Mr. A. B. Gahan of this section as Eumicrosoma benifica, new genus and species, is an interesting find and serves to show that there is still opportunity for profitable studies among even our oldest and supposedly best known insects.

The following gentlemen conprise the House Committee on Agriculture of the next Congress:

Asbury F. Lever, Chairman, South Carolina; Gordon Lee, Georgia; Ezekiel S. Candler, jr., Mississippi; J. Thomas Heflin, Alabama; James T. McDermott, Illinois; John A. Maguire, Nebraska; Thomas L. Rubey, Missouri; James Young, Texas; H. M. Jacoway, Arkansas; Ralph W. Moss, Indiana; John V. Lesher, Pennsylvania; Michael K. Reilly, Wisconsin; Benjamin I. Taylor, New York; Dudley Doolittle, Kansas.

The Eastman Kodak Co. list a "Crown Tilting Tripod Top" at $3. Quoting from the catalogue: "By the aid of this attachment the camera may be tilted at any angle upward or downward, and also reversed for verticle pictures without changing the back or removing it from the tripod." In entomological work it will be a very useful apparatus, especially in field work, in photographing insects and their injuries directly from above and for photographing at at angles impossible to obtain by the use of the tripod alone. For an illustration of the apparatus see page 89 of "Eastman Professional Photographic Apparatus and Materials," a catalogue issued by the Eastman Kodak Co. (J. J. D.)

A convenient container for slide boxes will be made to order by a La Fayette, Ind. firm according to the following specifications, at 50 cents each or $5 per dozen. The outside measurements of the box, which will be made of linden, are 4-3/4 by 10-3/4 inches and 7-1/2 inches high. Its construction is similar to that of a card index box, having a hinged top with a hook lock on the front, and it will hold seven wooden slide boxes of 25-slide capacity. Such a box will be useful in sending large slide collections from station to station; permit a satisfactory and uniform arrangement of the material; in systematic collections will permit rearrangement, additions, etc., to be made without necessitating a complete rearrangement of slides; will keep the boxes from dust; and as the lids of the individual boxes are never very secure and are easily overturned, the container will greatly reduce chances of "pieing" the slides. (J. J. D.)

The first number of the Journal of Agricultural Research, a new publication of the Department of Agriculture, will appear October 10. It contains a contribution from the section of Cereal and Forage Insect Investigations entitled, "The Serpentine Leaf Miner," (Agromyza pusilla Meig.)

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U. S. DEPARTMENT OF AGRICULTURE,

Bureau of Entomology.

NEWS-LETTER
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No. 8,

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Illinois State Laboratory of Natural History
URBANA, ILLINOIS, U. S. A.

Vol. I, No. 8.

November 1, 1913.

THE DEVELOPMENT OF AN ENTOMOLOGIST.

The following letter received some time ago from one of the brightest and most promising of the younger generation of entomologists, not in the Government service, will appeal to more than one of the members of this division.

"It appears to me that the form of teaching which deals with book statements regarding insect life, and with pictures, even good lantern slides, largely, instead of with living, active insects will always fail to make a man into an independent observer. All this sort of teaching should follow, rather far away, the study of the living, active organisms themselves.

"Years ago, when I was a boy collecting insects and beginning to mount them rather well, our botanist and entomologist said to me one day, 'You do not seem to be at all interested in this work. I wish you would take this book and read up about these butterflies and their habits.' I did read up and acquired almost and active dislike for the subject. But I did notice some illustrations of native bombycids, and did find among some papered specimens a Luna moth or two which I mounted. Then, in the winter I ran across the cocoon of what we called Platysamia ceanothi. It was to me very marvelous, the tough outer envelope, the beautiful brown inner cocoon suspended from the outer. A much more perfect cocoon than that of the eastern form. And when the moths from a dozen such cocoons emerged in the spring I raved over their beauty. That woke me up.

"I put aside all the books the second summer, stopped general collecting except in the butterflies of the region, whose beauty held me; and began rearing everything under the sun. That summer I learned more about insect life than in all the years that followed for another decade. The delightful novelty of the whole thing was so amazing. I resolved to be an entomologist.

"The third summer I began making exhibition mounts for our collection. I had a mounted life history of the cabbage butterfly; another of the Platysamia of which I spoke; one of a nest of wasps, Polistes, with bottled stages, from the eggs to the adult; carpenter worms and their work with the chrysalids and male and female moths; the clothes moth; the larder beetle; various insect galls and their makers, and the larval stages. I think they were excellently mounted and labeled; the whole thing done with taste and great accuracy. These rearings, and the making of these mounts gave me an interest which has made or marred my whole life (mother wanted me to be an Episcopal clergyman). Any amount of lecture work in the class room would have been listened to attentively, on it I should have passed good examinations; I would have forgotten it all by now. The joy of doing it all myself, the pleasure of learning, the zeal and enthusiasm growing out of the use of my growing powers faster than they really grew; these things made me an entomologist."

There seems to be some misapprehension, among some of the men of this division, relative to cooperative work within the section, due to the fact that they have not taken all factors in the question under full consideration.

There are some points at present to be considered that have never before confronted those engaged in entomological work in this or any other country. Ever since the dawn of applied entomology, workers, both State and National, have been few and widely separated. Cooperation has not, except in rare cases, been possible, and each investigator has applied himself to the study of such insects as occurred in his immediate neighborhood or in his particular State. Indeed, no other course was left open to him. When his work was finished and the results published, the information was almost necessarily at once applied to the entire country, over which the subject of his study was distributed. We are now coming to find out, and much to our sorrow, that in many cases what was found true in one part of the country did not necessarily hold good at distant points. Farmers, following recommendations given for a certain section of the country, found that the advice given them offered them little or no aid in protecting their crops, and they proceeded at once to blame the entomologist. As it was not possible for the entomologist to be in more than one place at once and then only inside of his own State, the defect could not possibly have been remedied. Under present conditions it will now be possible to put two score men of this branch at work on the same insect, at as many different points in the United States, on the same day if necessary; something that could never have been done before in the history of entomology.

Never before has there been such a group of trained entomological investigators brought together, working as a single body. For this reason, by mutual cooperation between individuals of this branch, we are able to carry out investigations over a wide range of country, under the same system and with strict uniformity, thus securing facts not before obtainable relative to whatever insect may be under consideration and under whatever environment it may occur. To assign to one man alone the investigation of an insect in any single locality, keeping others of the force in other localities under different environments from doing so would be to place ourselves back into the old methods of doing things, but without the same justification, besides unnecessarily sacrificing the prestige we have gained.

With our advanced position we must of necessity revise our methods to correspond therewith. This can only be done by assigning to an investigator a certain piece of work in which he must be able to hold the lead, while everyone else throughout the area of distribution of that species makes all the observations possible and does all possible work thereon whenever and wherever it can be done. Then, when the results are brought together and published, we shall have something that will be as accurate for one locality as for another - just what has never before been possible, nor can it now be possible under any other system except one as exact and comprehensive as ours. It goes without saying that not only will the individual be able to present matter such as could not previously have been obtained, but also, as strict credit must in all cases be given, those who have aided him have in this way lost nothing and will themselves reap a similar benefit when it becomes their duty to take up some major problem, study it, and publish thereon.

The fact is that we have entered upon a new area, from which less powerful and well organized bodies are necessarily debarred. We can now do, by internal cooperation, what has never been possible heretofore, in which, in the end, the individual worker not only loses nothing in the way of individual credit, but, sooner or later, is bound to gain immensely thereby.

In dissecting small larvae it is convenient to hold them by imbedding to a slight depth in paraffin. In order to render the structure easily visible the paraffin may be blackened by melting into it a small quantity of shoe-blacking (paste). The melted paraffin may then be poured into an ordinary flat-bottomed watch glass. A larva may be imbedded at any time by melting a groove in the paraffin with a fine wire. The dissecting may be done on the stage of the binocular microscope under water or alcohol and the preparation covered at any time with another watch glass. W. R. McCONNELL.

A very satisfactory vial for collecting small Coleoptera can be made with any large vial with cork to fit, and a small test tube whose diameter is smaller than that of the cork. Bore a hole through the cork slightly smaller than the diameter of the test tube and after breaking off the bottom of the test tube, force it through the hole in the cork until the mouth of the test tube is even with the top of the cork. Then insert the cork into the vial. Do not break the bottom off the test tube with any care as the more uneven the break the more satisfactory will it be. The test tube should protrude about one inch into the vial from the bottom of the cork. This contrivance acts like a trap, as the beetles which are dropped into the vial through the test tube do not attempt to crawl out. When in the field the mouth of the test tube may be left open, thus eliminating the nuisance of a stopper. The vial can be carried in any position without fear of the beetles falling out. E. H. GIBSON.

A common pasteboard mailing tube, such as is used by the department in sending out liquids and other supplies, may be easily converted into a very satisfactory jassid collecting tube. The most convenient size tube is the one 6-1/2 by 1-1/2 inches. The end with the tin screw top should be left intact, while the other end is knocked off and over this end stretched a piece of white cloth, such as is used in covering insect cages. Most any kind of cloth which is of light weight and allows the light to penetrate through will do. The cloth is stretched very tightly and held so by an elastic band. Jassids caught in a net may be transferred into this tube by unscrewing the tin cap and placing this open end over the jassid against the net. Once the jassid is in the tube and the tin cap put back on, the jassid will hop to the other end, attracted there by the light coming through the cloth, and stay there. The advantage of this tube is in the fact that the tin cap may be taken off for a couple of minutes at a time without any fear of losing the jassids already in it, as they will remain at the cloth end. There is no sweating within the tube. A tube of the above mentioned size will accommodate fifty jassids. E. H. GIBSON.

Mr. W. R. Thompson, who has during the past year been engaged in collecting and forwarding parasites of the alfalfa weevil, has resigned to take up a course of study in the University of Paris. He will, however, continue his connection with us as collaborator.

Two tachinid parasites of Plathypena scabra have been reared recently at the Greenwood station by Mr. E. H. Gibson. Neither of them has before been recorded from this host. They are Cuphocera ruficauda and Neopales flavicauda V. d. Wulp.

Experience during the last two seasons has shown that ordinary tin tomato cans are preferable to earthenware florist pots for carrying insects on growing food plants. The plants thrive much better and seldom need watering. The Hawaii Station has discarded the pots for cans for growing seedling plants. GEO. G. AINSLIE.

Mr. Wildermuth has succeeded in rearing the tachinid fly, Compsilura concinnata from the larva of the range caterpillar (Hemileuca oliviae). This is one of the imported enemies of the gipsy and brown tail moths, material for this experiment having been supplied by Mr. Burgess from the gipsy moth laboratory at Melrose Highlands, Mass.

The discovery of alfalfa weevils, in potatoes shipped in refrigerator cars, has been duplicated by Mr. Miles of the Salt Lake City, Utah, laboratory, who has been stationed for some time at Denver, Colo., charged with the examination of all such freight cars consigned from within the area covered by the weevil. There were very few individuals in any of the cars.

The rhynchophorid beetle Centrinus penicellus has been found breeding very generally, throughout the southeast, in the stalks of corn. The egg is placed in the stalk, at the base of the tassel, and the larva works downward, usually to the second node, where it will be found about mature in early October, forsaking the stalk for the ground in late fall or early winter. I would like to get records of the presence of this beetle or its larvae from other localities. GEO. G. AINSLIE.

During late October the Range Caterpillar Investigation Camp, near Koehler, New Mexico, was discontinued until the opening of the investigation next spring. The equipment has been stored and the men distributed to other field stations. Despite the unusually discouraging weather conditions, the results of the season's work have been very encouraging and all has been accomplished that could have been expected. We shall begin another year with a great deal of the preliminary work out of the way, in excellent shape to follow out projects which it has not been possible to take up at all this year

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U. S. DEPARTMENT OF AGRICULTURE,

Bureau of Entomology.

NEWS-LETTER

OF

THE

OFFICE OF CEREAL AND FORAGE INSECT INVESTIGATIONS.

Volume I,

No. 9,

December 1,

1913.

Illinois State Library [illegible]

Vol. I, No. 9.

December 1, 1913.

In the May number of the News Letter reference was made to the rearing of numbers of Aphidius testaceipes by Mr. Urbahns at the Glendale, Cal., station and their consignment to the secretary for the the Crown Agents for the Colonies in London and their further consignment to their destination in British East Africa. It is with considerable regret that we give below a report of Mr. Thomas J. Anderson, Entomologist for British East Africa. The outcome, however, of this experiment will be of interest to all members of the division.

"The consignment of Aphidius arrived in June. It is now September and not a single specimen has yet hatched. As soon as the boxes arrived I took the contents out and placed them under glass jars, in the shade, in order to notice when hatching began. I had pots of wheat and other plants ready covered with aphides and on the first signs of hatching I intended to transfer the Wheat with the parasitised aphides to the pots which had gauze covers ready. I have dissected many parasitised aphides and in every case the parasite was dead. The boat was met on its arrival and the box was brought straight here, without being opened at the Coast.

"I know you will be very disappointed and I am very sorry indeed that the trial has not met with success, especially after all the trouble you and Doctor Howard have taken. I do not know what can have happened.

"On the other hand I find aphides here very well parasitised already and Toxoptera has not made any headway this last season.

"I must apologize for not answering your last letter sooner but I was hoping against hope that some parasites would hatch and that I could let you have a favorable report."

DEPARTMENT OF AGRICULTURE, OFFICE OF CHIEF CLERK.
WASHINGTON, D. C.

November 18, 1913.

Dr. L. O. Howard, Chief,
Bureau of Entomology.

Dear Sir: I quote below a letter just received from Mr. N. A. Merritt, Washington City Postmaster. Please take such action as is possible without detriment to the public service to comply with Mr. Merritt's request.

Very respectfully,
(Signed) R. M. Reese,
Chief Clerk.

The Chief Clerk of the Department of Agriculture.

Sir:

If not inconsistent with the public service, I beg leave to request that the dispatch of supplies and official printed matter from your Department, both ordinary and registered, be curtailed to the minimum during the period from December 18 to 24, 1913, inclusive, to enable the employees of this office to more satisfactorily cope with the Christmas business, the amount of which I anticipate will be very heavy.

Very respectfully,
(Signed) N. A. Merritt,
Postmaster."

All parasitic or predaceous insects submitted for determination should be accompanied by the name of the host insect, if the same be known. This is necessary for the information and guidance of the person making determinations and will aid materially in securing them promptly.

When determinations are received at field stations they should at once be entered on the notes. This becomes of especial importance in case the notes have not been submitted to this office for copying, for the reason that an omission to enter such determinations may cause endless complications and confusion when, perhaps years afterwards, the notes are worked over for the purpose of publication.

In the dry air of the Southwest one loses but few specimens from mold even when material is tightly corked in glass vials. I refer to material that is reared and preserved unmounted. But I find that in the more humid air of the Mississippi Valley insects so preserved are apt to mold in a very short time. For years, in field work, I have been using gelatine capsules and find them admirably adapted for the purpose of keeping unmounted insects. They are light, unbreakable, transparent enough so that labels can be read through the gelatine, and the capsules appear to absorb the surplus moisture from the insects within so that they have never molded, so far. I use the No. 00 size, and in a properly managed drug store these should be bought for 10 cents per hundred. It may be that in the still more humid air of the Gulf States these capsules will suffer from excess of moisture, for of course they are sensitive to humidity and easily dissolved. Experience alone would settle the question of their use in Southern surroundings. C. N. AINSLI

For a good many years I have been looking for some medium that would be perfectly adapted for use in mounting soft-bodied larvae, such as those of Isosoma, for microscopic study. For many such objects, glycerine is an ideal medium, except that it tends to make tissue too transparent, and, being a solvent of certain minerals and gums, it is often difficult to seal it permanently.

Glycerine jelly is good, but not easy to manipulate, and possibly not well adapted for general microscopic mounting, although an admirable medium for the preservation of tissue, both animal and vegetable.

For thirty years and more I have experimented with Farrant's Medium (gum, glycerine, and water), and sometimes it affords mounts of unexpected beauty and value. Recently I have been using this compound for mounting small larvae of Diptera, and the like, and although there is a slight shrinkage there is not the general mummification that Canada balsam nearly always produces. The medium penetrates the tracheae slowly, if at all, while striated muscle shows finely for some time. I put the living larvae directly into the Medium and there is no cloudiness afterwards as with balsam. Air bubbles are easily acquired in this medium, and they do not disappear as in balsam, but these can be avoided, as they can in Glycerine jelly, if one knows how.

Can any of the men suggest any other medium that will preserve these larvae in better condition than Farrant's? I want one that will do for hymenopterous eggs and the most delicate objects, and am still in search of a perfect mountant. C. N. AINSLIE.

Mr. V. L. Wildermuth is spending some weeks in the Washington office engaged in the preparation of manuscripts for publication.

Among the callers at the office during November were Prof. C. P. Gillette, Ft. Collins, Colo., Prof. S. B. Doten, Reno, Nevada, and Dr. C. R. Ball, Logan, Utah.

The faculty of Iowa State College has under consideration the matter of establishing a course in entomology tending to fit men for Government and experiment Station positions.

The entomological paper in No. 2, Vol. I, Journal of Agricultural Research, is by Mr. W. Dwight Pierce, the title being "The Occurrence of a Cotton Boll Weevil in Arizona."

To prevent waterproof ink from running in a diluted alcohol solution, the label should be saturated with absolute alcohol, and allowed to dry before placing in the weaker alcohol solution.

T. D. URBAHNS.

Mr. R. J. Kewley has been transferred from Salt Lake City, Utah, to La Fayette, Ind. Mr. Harrison E. Smith has returned from Koehler, New Mexico to Wellington, Kans., while Mr. D. J. Caffrey is working over the eastern portion of the former State in continuation of the range caterpillar investigations.

A convenient formula for diluting solutions, such as alcohol, from a given strength to some other desired strength is as follows:

$$\frac{100}{\text{Desired strength}} \text{ x } \frac{\text{Quantity to be changed}}{1} \text{ x } \frac{\text{Present strength}}{100} = \text{Total amt.}$$

Example. -To reduce 20 cc. of 95% alcohol to 70% alcohol solution:

$$\frac{100}{70} \quad \frac{20}{1} \quad \frac{95}{100} = 27.1 \text{ (add water to make 27.1 cc.)}$$

T. D. URBAHNS.

There has recently been discovered among the files in the Bureau of Entomology a considerable number of sets of illustrations struck from copper plate engravings originally made for the Loew and Osten Sacken Monograph of North America diptera. These belong to Volume III, Dolichopodidae, Plates III-VII inclusive; Ortalidae and Trypetidae, Plates VIII-XI inclusive.

Also complete sets of uncolored plates from de Sassure's North American Vespidae, Smithsonian Misc. Coll. No. 254. All of these plates are beautifully drawn and engraved and should be of value to students and others interested in the orders Hymenoptera and Diptera. They will be distributed free of charge to all who apply for them to the U. S. Bureau of Entomology, Washington, D. C.

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U. S. DEPARTMENT OF AGRICULTURE,

Bureau of Entomology.

NEWS-LETTER
OF
THE
OFFICE OF CEREAL AND FORAGE INSECT INVESTIGATIONS.

Volume II,
No. 1,
January 1,
1914.

Vol. II, No. 1. January 1, 1914.

A NEW DEPARTURE IN ECONOMIC ENTOMOLOGY.

This past season the U. S. Bureau of Entomology undertook an entirely new method of entomological work, a work as unique as it was economic and as economic as has been the usual line of work in the past.

For some years past a caterpillar of the moth, *Hemileuca oliviae*, has been devastating certain portions of the cattle and sheep ranges of northeastern New Mexico, feeding upon the gramma grasses of this region. Finally the pest began assuming such proportions and the territory covered increased so rapidly that an urgent appeal was made for an investigation. In 1909 and 1910 Mr. C. N. Ainslie made a preliminary survey and study of the species, the results of which were published in Bulletin No. 85, Part V, of the Bureau of Entomology. Following this study it was at once appreciated by the stockmen of the territory that unless natural barriers checked the spread, something definite must be done in order to keep the pest from overrunning the grazing areas of not only New Mexico but adjoining States. Accordingly, through the efforts of stockmen, Senators, and Representatives of the States interested, the last Congress appropriated a special sum of money for a thorough investigation of the insect, including methods of control and means of preventing the spread of the depredator.

In undertaking this investigation, a number of problems presented themselves to the ones who were planning the carrying out of the work. One of these was the fact that as the infested area is a grazing area the country is sparsely settled and the towns are few, far between, and of small population, thus making it difficult and practically impossible to secure proper lodging and board for a force of men. This, together with the fact that many of these towns have small irrigated areas surrounding them and thus no infestation of Hemileuca near by, necessitated the organizing of a field party. This was finally accomplished, and in May (1913) tents were pitched and the camp formally opened, it being located on a 100,000-acre ranch belonging to the Springer Bros, about 18 miles from Raton, N. Mex., and five miles from Koehler, a small mining town on the Cow Creek Ranch. The camp had only prarie dogs, coyotes, and rattlesnakes for neighbors, and the nearest shade tree was miles away.

At the beginning six men besides the writer and the Japanese cook were assigned to the camp. Later in the summer two more men were added to the force, so that as many as ten were included in the party. Five tents were used. One of these, 16x20 feet, was used as a cook tent. Three, 14x16 feet, were used as sleeping and laboratory tents and one of the same size for a supply tent, for equipment, etc. Owing to the fact that we were located in a southern latitude the heat of midday was often extreme while the high altitude, some 6,500 feet, caused cool and often cold nights. This midday warmth accompanied by many heavy showers necessitated the equipment of our tents with tent flies, and the cool nights necessitated an abundant supply of bedding for our cots. The party was thus well protected against the elements.

Table supplies were secured at Raton and transported from the nearest railroad station by wagon, except for a period in June, when heavy rains washed out railroad tracks and telephone lines (this in a dry country). thus cutting us entirely off from the outer world - or would you say "inner world"? We were always well supplied with food and other necessities. A near-by "watering hole" with its friendly well and windmill supplied us, as well as our friends, the cattle, with abundant drinking water.

For locomotion we many times used our own motive power but for convenience and for longer trips were supplied with two cow ponies and two Indian motorcycles, the latter with tandem attachment for carrying double. We were thus able to cover a considerable area and, being located not only in the midst of the outbreak but probably near where it had its origin, we were able to "live with our work," literally as well as figuratively.

For an insectary we tried several arrangements. We had to have shade. First muslin was used, but because of the heavy winds which spring up nearly every afternoon from the snow-capped mountains to the west and southwest of us, this was shown to be impracticable. A tent could not be used because of the already mentioned midday rise in temperature. So finally a tent fly was secured, only instead of being over a tent it was itself resting upon a ridge pole and with the lower edges tied high up on the supporting guy posts so that there was abundant circulation of air from all sides. This was found to be a very satisfactory arrangement and was of course a protection from the rain as well as from the sun. Convenient shelves were then constructed and placed beneath this, thus making room for our small cages, trays, etc. This kind of protection proved to be so well adapted to the work that it seems that it could be used to advantage in other sections or at other laboratories where only a temporary shade is wanted.

Our work was divided along five lines: First, the life history and habits of the range caterpillar. This had already been admirably carried through one season and parts of others by Mr. C. N. Ainslie but was now considered from a broader viewpoint and over a larger section of the country, with better equipment for carrying through the work. Second was the scouting work to ascertain the present distribution of the species and the corresponding relation between its distribution and natural barriers. We find a considerable relation here, the mountains to the west apparently checking it entirely, while the extremely dry area in central New Mexico is almost as complete a barrier. The path of dispersion from the present area is open to the eastward.

The third division of our work was the mechanical methods of control. Under this work came such things as brush dragging, rolling, and burning the infested area. Of course it at once occurs to the reader that these methods are almost prohibitive because of the relatively small value of the land per acre and the greatness of area covered and managed by one man. However, it was hoped that some success might be had in this line, as often severe outbreaks occurred in spots or restricted areas especially on the edge of newly infested territory. The results of such work were not very encouraging, however, and more experimenting is needed along this line.

The fourth division, the rearing and study of native parasites and enemies, was really divided into two branches. The rearing of native parasites was conducted by the Bureau of Entomology while other enemies, such as birds and mammals, were studied in cooperation with the U. S. Biological Survey, a man being detailed from that office to oversee the work.

The fifth division of work, that of parasite introduction, is one that gave us considerable hope for a control of the pest, but like others is quite uncertain. As there is no other species of Hemileuca that occurs in numbers sufficient for parasite development we had to look for parasites and predaceous enemies of altogether different families. Several shipments of predaceous beetles and tachinids were received from the Gipsy Moth Laboratory, through the kindness of Mr. Burgess, and while we do not know whether these will survive the northern New Mexico winters it is gratifying to note that several species of Calosoma took hold nicely, while the tachinid, Compsilura concinnata has been successfully carried through on Hemileuca larvae.

The work, having been largely preliminary this past year, will be continued during the season of 1914, and we hope with more desirable weather conditions and a knowledge gained by the past summer's experience, to be able to accomplish much more during the coming summer.

V. L. WILDERMUTH.

I was interested in Mr. Urbahn's formula for diluting alcohol, but I think he has complicated the matter unduly. Since the two 100's he gives cancel, what is their use? Why not make the formula more simple, as,

$$\frac{\text{Present strength}}{\text{Desired strength}} \times \frac{\text{Quantity to be changed}}{1} =$$

Or better and more simple still use the following formula:

Desired strength : Present strength :: Quantity to be changed : X
70 : 95 :: 20 : X

But in any case this is a formula that is hard to remember, and the simplest formula for diluting alcohol which is given in most text books is as follows: "To obtain a given per cent of alcohol through dilution of a higher per cent with distilled water, subtract the percent required from the per cent of the alcohol to be diluted; the difference is the proportion of water that must be added. Thus, if 35 is the per cent required, and 95 the per cent to be diluted, then 95 - 35 = 60; hence 60 parts of water and 35 parts of 95 per cent alcohol are the proportion for mixing." (Guyer.) This is a very simple formula and one which can be remembered quite easily. I would suggest also for the News Letter the value of the alcoholometer. This is a simple apparatus costing about $1.50 with which the per cent of any alcohol can be obtained. We have had such an instrument and the two cans of alcohol received from the supply department at Washington have tested 95 1/2 and 94 per cent, respectively. Alcohol purchased at drug stores is liable to vary considerably and for this and other reasons an alcoholometer is a handy instrument to have on hand. J. J. DAVIS.

If those who applied for the plates mentioned on p. 3, December News-Letter, have found that Plates 3 and 4 of the Vespidae are missing. These will be supplied them on application to the Chief of Bureau.

Mr. L. P. Rockwood, of the alfalfa weevil investigations, working on introduced parasites, has been doing some work in the office and also in the U. S. National Museum.

The Iowa State College is about to establish a course in entomology that, it is expected, will fit young men for filling positions in Government and State service in applied entomology. Dr. R. E. Buchanan, Acting Dean of the School of Science, writes under date of December 2, 1913, "We realize that we can not step into the front rank in a day, but we intend to make some serious beginnings this year toward developing our work in entomology."

Elaterid larvae are found in the soil, under stones, moss in woodlands, and the bark of rotten logs and stumps, and may be collected in large numbers by following the plow.

If facilities are not at hand for rearing they may be placed in small salve boxes, obtainable at headquarters or from any druggist, filled with moist sphagnum moss, obtainable from any florist; or if this is not at hand, any moss will answer. Only one larva should be placed in box, as some of the forms are predaceous. The boxes may be packed and mailed to the Hagerstown, Md., laboratory.

For rearing elaterid larvae, place a quarter-inch layer of plaster of Paris in the bottom of a salve box and fill the box with the natural nidus of the larvae (wood pulp, earth, moss, etc.), and feed with as near normal food as possible. We have been successful in rearing all of the forms so far obtained with but two kinds of food, wheat grain and insect larvae. When normal food is unknown give the larvae wheat grain and any soft bodied larvae to determine whether predaceous or plant feeding forms. Lachnosterna larvae are unfitted for this, as they often destroy elaterid larvae by mutilating them.

JAMES A. HYSLOP.

MEMORANDUM NO. 53.

December 4, 1913.

Regarding attendance upon meetings of scientific and related societies.

With a view to clearly defining procedure in the matter of attendance by employees of the Department at meetings of scientific and related societies the following memorandum is submitted.

The Department may from time to time desire to have a limited number of representatives attend such meetings, either to acquire information or to present facts of interest and value to the public. In such cases the Department will officially designate the representatives, and their usual expenses for travel and subsistence will be paid.

It is recognized that the attendance of scientific workers at meetings of their associates is desirable, but it is believed that such attendance should be regarded more for the purpose of instruction and training, or direct personal advantage to the employees. Employees should be encouraged to attend such meetings, and when attendance is recommended by the chief of the Bureau concerned, leave of absence with pay may be granted. All expenses, however, should be borne by the employee. Emphasis should be laid on the necessity for not permitting the work to be injured by over-depletion of the force at any one time.

Each case will need to be treated on its merits and receive the recommendation of the Chief of Bureau and the approval of the Secretary in advance.

(Signed) B. T. GALLOWAY,
Assistant Secretary.

Mr. Jas. A. Hyslop has been doing some work in the National Museum on the Elateridae.

Mr. D. J. Caffrey, who has been searching for Hemileuca in New Mexico, has been assigned to temporary duty at the Tempe, Ariz., station.

Mr. R. N. Wilson has spent some time in the office and will work during the remainder of the winter in the Charlottesville, Va., laboratory.

Mr. Wildermuth, who has been in the office for some weeks engaged on the manuscript for a bulletin on *Eurymus eurytheme*, has returned to Tempe, Ariz.

Authors publishing entomological articles in non-entomological journals, who desire to have such articles noted in its current literature list, will do well to send copies of them to ENTOMOLOGICAL NEWS, 1900 Race St., Philadelphia, Pa. After note has been made of the same, they will be deposited in the library of the American Entomological Society.

Among the December appointments to this office was Mr. Adolph H. Beyer, University of Kansas, assigned to the Columbia, S. C., station, and Mr. Chas. F. Stiles, Mississippi Agricultural College, assigned to the Greenwood, Miss., station, superseding Mr. E. H. Gibson, transferred to the Tempe, Ariz., station.

In the last News-Letter I notice Mr. Urbahns's formula for the dilution of alcohol. It is near enough for practical purposes but it is not correct. The point is that while weight is indestructible—that 1 pound of a substance added to 1 pound of another always gives 2 pounds, it is not true of volumes. Atomic condensation comes in with liquid and with alloys. Thus 1 cc. alcohol (pure) plus 1 cc. water will not give 2 cc. but a little less. J. T. MONELL.

My laboratory tables are made of white pine, are 2 feet wide and 1 3/4 inches thick when dressed. They should be made a length suitable to the purposes for which they are to be used. They are tongued-and-grooved and put together with glue as it is next to impossible to get a board of that width now. There should be a leg at each four corners for a short table and two in the middle if the table is long. These legs are hard pine and 2 1/2 inches square at top and begin to taper about half way down the leg. At each corner where these legs attach an inch and a half hole is bored, 3/4 in. deep. The leg is then made with a corresponding offset to fit this hole, then two right-angled iron braces are screwed to the legs and the tables, which firmly and securely hold the legs in place. These legs can be made any convenient length. Then a [illegible] finished two-drawer cabinet (perfectly plain) 13 1/2 in. x 22 in. (inside measurement), made of white pine should be made and placed on top of the table at one end. If it is a long table, make one for each end. This will give sufficent drawer space and it will not be in the way of the knees while working. I put no finish whatever on the table, but this wood will ebonize beautifully if that is preferred. This table has another advantage in that it can be quickly taken apart and shipped (when wrapped) as an ordinary board. I forgot to mention that there should be couple cleats (about 3/4 in. thick) screwed crosswise of the table underneath to prevent any possible warping. This is the most convenient, workable table I have seen for laboratory use, and any shop or good carpenter can easily make it at nominal cost. W. J. PHILLIPS.

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U. S. DEPARTMENT OF AGRICULTURE,

Bureau of Entomology.

NEWS-LETTER

OF

THE

OFFICE OF CEREAL AND FORAGE INSECT INVESTIGATIONS.

Volume II,

No. 2,

February 1,

1914.

Illinois [illegible]
Urbana, [illegible]

Vol. II, No. 2.

February 1, 1914.

An entirely new innovation, which will doubtless be followed in the near future by other lines, is just being undertaken by the Chicago Burlington and Quincy Railway by which "every inch of tillable ground along the 10,000 miles of track of the Burlington railway system is to be turned over to farmers and sewed in alfalfa and maintained as a perfect lawn. The company has several good reasons for the innovation.

"It is believed that by maintaining an evergreen right of way, as alfalfa never dries in the ground, much of the danger from right of way fires will be eliminated.

"Speaking of the plan John B. Lamson, agriculturist for the Burlington road, said:

"'There are a number of reasons for planting our right of way with alfalfa. First, we hope in this way to extend the field of alfalfa, to interest more farmers in the cultivation of this wonderful hay. It will fill the right of way that is tillable, and where nothing but weeds now grow. This will of course be a financial benefit to the farmer. Alfalfa is ever green and will, we think, prevent many fires that occur by sparks falling along the right of way. During dry times ordinary vegetation, particularly weeds, along the right of way, become dry and easily catch fire from locomotive sparks. These sparks falling on green alfalfa will do no harm.

"'Another reason, and one which may appeal more to the general public, is that the alfalfa will present a pretty appearance from the car windows, will keep down dust to some extent and will give the appearance of the train running through a high grass lawn. Alfalfa resembles a flower and the optical result may be more pleasing than we imagine.

"'Of course, there are many places where the right of way is in cuts or on hillsides, where cultivation of the right of way is out of the question, but we estimate that roughly there will be between 25,000 and 30,000 acres of right of way that will be available to the farmers.

"'The right of way land will be leased to owners of farms adjoining such right of way at $5 for each farm. Already we have received a number of signed leases. This amount will be paid but once and will be for all time, the idea for a nominal charge being to establish a contractual relation between the railroad and the farmers.'"

In some recent correspondence with Mr. Lamson he expressed himself as very anxious to cooperate with us in keeping a surveillance over the railroads right of way with reference to the entomological significance of this new course that his road is taking up. In all probability the same course will be followed by other trunk lines, thus opening up a new feature of our work.

Among the recent visitors in the office were Dr. H. T. Fernald, Amherst, Mass.; Dr. W. E. Britton, New Haven, Conn.; Dr. E. P. Felt, Albany, N. Y.; Prof. P. G. Parrott, Geneva, N. Y.; Dr. C. Gordon Hewitt, Ottawa, Canada; and Mr. J. R. Parker, Bozeman, Mont.

Mr. [illegible], appointed January 1, was assigned to duty at the Greenwood, Miss., station, resigned on January 5.

Mr. L. P. Rockwood who spent some time in the office in December has returned to Salt Lake City.

Mr. E. O. G. Kelly spent some time in the office, chiefly engaged in the preparation of manuscript.

Mr. Geo. W. Barber, a graduate of the Mass. Agr. College, Class 1913, was appointed January 1 and assigned to the College Park, Md., station for duty.

Dr. Aldrich is spending some time in the office, working on the collections of Sarcophagidae. If there is any undetermined material in the hands of any member of the force it should be sent in at once for determination.

A METHOD OF REARING THE LARVAE OF DIABROTICA.

The most successful method used at the Hagerstown station for rearing Diabrotica 12-punctata has been to confine adults singly in the small tin Coleoptera rearing boxes to obtain their eggs from which to raise larvae. The boxes were prepared for the purpose by filling them about three-quarters full of dental grade plaster of Paris and blackening the surface of the plaster and the sides of the box with diluted India ink. The boxes found most convenient to handle were the ones about 1 3/8" deep x 1 7/8" diameter. The plaster served at once to confine the beetles in a small space at the top of the box where they could be easily observed with the binocular if desirable and to furnish a surface which, while much more nearly approximating the natural soil surface in which they are supposed to lay their eggs than the tin, at the same time prevented them from burying their eggs so that their development could not be watched. Blackening the inside of the box made it much easier to see the pale yellowish green eggs and the little white larvae which hatched from them. Accurate note keeping was possible only by limiting the number of adults per box to one. The beetles were confined by means of small glass plates instead of the tin box covers, so that they could be observed without disturbing them, and they were kept supplied with a fresh leaf from one of their favorite food plants. The beetles laid their eggs in bunches of one to eight or more, usually on the surface of the plaster, sometimes on the sides of the box, on the food leaf, even on the glass cover, and occasionally placed them in the little bubble holes in the plaster.

When the eggs hatched the little larvae were placed singly on small sections of young, tender corn plant stems in still smaller plaster of Paris cells. These cells were made by filling the covers of the boxes used for the above cages and other small, shallow boxes with plaster of Paris, pressing glass plates against the surface, and allowing the plaster to harden with the plates in position. The plates were then removed and cells hollowed out in the plaster about one inch long, deep enough to contain a section of the young corn stem, and wide enough for two of these sections, so that fresh food could be kept in the cell without disturbing the larva, and at the same time not allowing so much material to accumulate that the larvae could not be easily found. The larvae also pupated in these cells. C. M. PACKARD.

Larvae of Phorbia (Pegomya) fusciceps have developed a fondness for young wheat. Professor Newell sent us adults reared from larvae attacking wheat in Texas; Doctor Morrill sent the same reared from larvae attacking wheat in Arizona while the flies were abundant in wheat fields of northern Oklahoma in December. It will be well for members of the force to be on the lookout for this pest.

My method for preventing the running of waterproof ink in diluted alcohol is to place the labels in the palm of the hand, drop a few drops of ordinary 95% alcohol upon them and allow this to remain for half a minute or so, when it is safe to place the moist labels directly in 50% alcohol without danger of the ink running. Absolute alcohol recommended by Mr. Urbahns, is not always available, and is not a necessity. C. N. AINSLIE.

Reports of outbreaks of Toxoptera in Texas and Oklahoma have on investigation turned out to be due to excessive abundance of Aphis avenae, though there are considerable numbers of the former species present. Aphidius testaceipes is excessively abundant and with favorable temperature conditions will doubtless hold Toxoptera in check. With temperatures unfavorable to the parasite, an outbreak of Toxoptera is not improbable.

While making entomological investigations during the last few years in the U. S. Bureau of Entomology, and prior to this, for the State of Illinois, it was found very convenient to have a definite idea as to whom to visit on reaching a new locality.

After considerable investigation and effort, the best party to visit to gather this information proved to be the banker, or, next to him, men in charge of flour mills or elevators. Quite often field men are given the names of parties reporting damage to their crops, and are directed to visit certain localities. On reaching the town, it is learned that the party wanted lives on a rural route or star route, some eight, ten, or perhaps fifteen miles from town. The writer has found that upon calling on the local banker, he could learn just what sort of a farmer he would have to deal with, and very often would find that the party has a rural telephone and communication could be established with him readily.

Bankers often have information of insect ravages from farmer patrons in that same locality, though possibly in a different direction from town, and, quite frequently, before leaving him, he would offer his services in the form of a good horse and buggy or an automobile.

On discussing this matter with Professor Webster, it was learned that in the early days he had used a similar method of getting information, only he went to the family doctors who were always to be found in small towns.

Beyond doubt field men will derive a great deal of help from consulting bankers and will find them a valuable source of information for other reasons than simply what they can gain from them on a single visit. Very often after having visited one of these men, he will keep the matter in mind and if anything shows up in his locality he readily reports it, thus placing us in continuous close touch with the situation. E. O. G. KELLY.

If those of the force will be kind enough to, whenever convenient for them to do so, collect dead stems of outstanding grasses containing hymenopterous larvae and send to Mr. Phillips, U. S. Ent. Lab., Charlottesville, Va., it will be a great help to him in his studies of Isosoma and for which he will gladly reciprocate.

Has any one reared hymenopterous parasites from Sipha (Chaitophorus) flava? None of the notes from any of the men of the division who have studied this species contain records of such, and Mr. Thos. R. Jones, Entomologist of the Porto Rico Sugar Experiment Station, states that it is not parasitized there. If any of the force reared parasites please let us have them for determination.

Occasional requests for Bureau publications are received from members of this division, through Congressmen, sent in this manner evidently under the mistaken impression that members of Congress have copies of such for distribution. Such requests are invariably referred to the Bureau, as no Congressman has copies for his own use, and nothing can be obtained in that way that cannot be secured by applying to the office direct.

A rearing cage for Diptera that has proven very useful to us, at the Wellington laboratory, consists of a tin can cigar box with a round hole, one inch in diameter, cut near the top into which a glass vial is inserted. The vial can be made to fit very tight by making a cone of heavy paper, rolling it so as to leave an opening nearly as large as the vial. Fill the can about two-thirds full of loose sandy loam or leaf mold, being very careful to avoid too much moisture as evaporation is very slow. Place Dipterous larvae or pupae or, in fact, any kind of insects that enter the ground for pupation, into the soil within this cage and wait their development. Adults upon issuing will enter the vial from which they can be removed. The cans can be bought from cigar stores at from one-half to one cent each, and a die for cutting the holes in them can be bought at any hardware store. E. O. G. KELLY.

Small quantities of Lachnosterna beetles may be shipped through the mails as follows,--Beetles should be saturated with 70% alcohol (never formaldehyde) and if the separate collections are wrapped in cloth packages, as they should be, these should be placed in tin cans with tight fitting lids, such as preserving cans, cans used for syrups, such as "Karo" syrup, or even paraffin coated or other waterproofed jars or bottles which are used for cream, milk, cottage cheese, etc. These are then placed in larger boxes for shipment. No additional alcohol should be added to the moist saturated beetles and the contents of the can should be packed so that undue jarring will not result. The alcohol on the saturated specimens will keep them moist and in good condition for examination for some time. If larger quantities are to be shipped a can, such as a milk can, with a tight fitting lid should be used, the lid being wired on and the can shipped by express. Pinned beetles may be packed and shipped by mail or express according to quantity. J. J. DAVIS.